21 December 1993
PS/LP Note 93-67 (Min)

CLIC/PS

NEXT MEETING : FRIDAY 21 JANUARY 1994

9.00hrs in the large PS CONFERENCE ROOM

J.H.B. MADSEN

AGENDDA

1. **The CTF run no. 4 (Nov.-Dec.'93) : results and comments**

   by H. Braun, JHB. Madsen, S. Schreiber

2. **Status CTF modifications**

Distribution:

Autin B.	PS	Joly Pierre	PS
Bossart R.	PS	Kamber I.	PS
Braun H.	PS	Koziol, H.	PS
Brouet M.	AT	Madsen J.H.B.	PS
Chautard F.	PS	Millich A.	SL
Corsini Roberto	PS	Pearce P.	PS
Delahaye J.-P.	PS	Potier J.-P.	PS
Devlin-Hill P. M.	PS	Riche A.J.	PS
Garoby, R.	PS	Rinolfi L.	PS
Geissler K.K.	AT	Schnell W.	SL
Godot J.-Cl.	PS	Schreiber S.	AT
Guignard G.	SL	Suberlucq G.	PS
Hübner K.	PS	Thorndahl L.	PS
Hutchins S.	PS	Wilson I.	SL
Jensen E.	PS	Wuensch W.	SL
Johnson C. D.	PS		

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Summary Notes of the CLIC/PS Meeting 03/12/93

1. CTF status

Results obtained with the Cs2Te cathode and the laser at 262 nm were presented (see app.1 and 2).

The charge in single bunch mode which can be passed through TRS without losses could be increased to 7 nC. With increasing laser energy on the cathode the charge from the gun saturates. This had been observed with CsI as cathode as well. Not yet sorted out if the saturation is a cathode or beam dynamics effect.

The laser system delivers about 150 10^{-6} J at 262 nm , 8 ps FWHH.

As the losses in the optical path to the cathode are lower than at 209 nm - transmission now 70 % - we are not any longer energy-limited. A problem appeared : the position of the laser pulse on the cathode jitters. This has been traced back to mechanical vibrations, temperature fluctuations and perhaps air turbulence.

2. Experiences with constructing a laser pulse train generator. P.M. Devlin-Hill.

See CERN/PS 93-34 (LP) , CLIC Note 209
Pulse train generator at 209 nm by P.M. D-H.

The causes of the timing error in the first stage of the generator are now fully understood. As reported in the above note already one cause was the incorrect injection of the laser pulse into the generator.

Another cause was found in the calculation of the detour lengths due to an error in the optical constant used at 209 nm.

With the knowledge acquired this type of generator could be set-up successfully and providing sub-picosecond timing accuracy.

Run n° 4

Cs_2Te Start 11 Nov. '93

Photocathode

- 100 MV/m after rf cond.
- QE ~ 1%
- low dark current (~ as Cu)
- laser phase scan ... zero charge at de-acc. phases but .. see Fig. 1 (charge between 30 – 100) different from Cs I Fig 2

Gun

- charge / laser energy ... saturation ≈ as with Cs II Fig 3.
- bunch length ≈ as with Cu + Cs I see below

energy on PC	charge at UHA385	FWHH at TCM405
~ 1.1 μJ	1.2 nC	10 – 13 ps
3.4 "	3.2 "	11 – 14 "
13.7 "	8.2 "	14 "
55. "	12.2 "	12 "

Run n°4

Cs_2Te

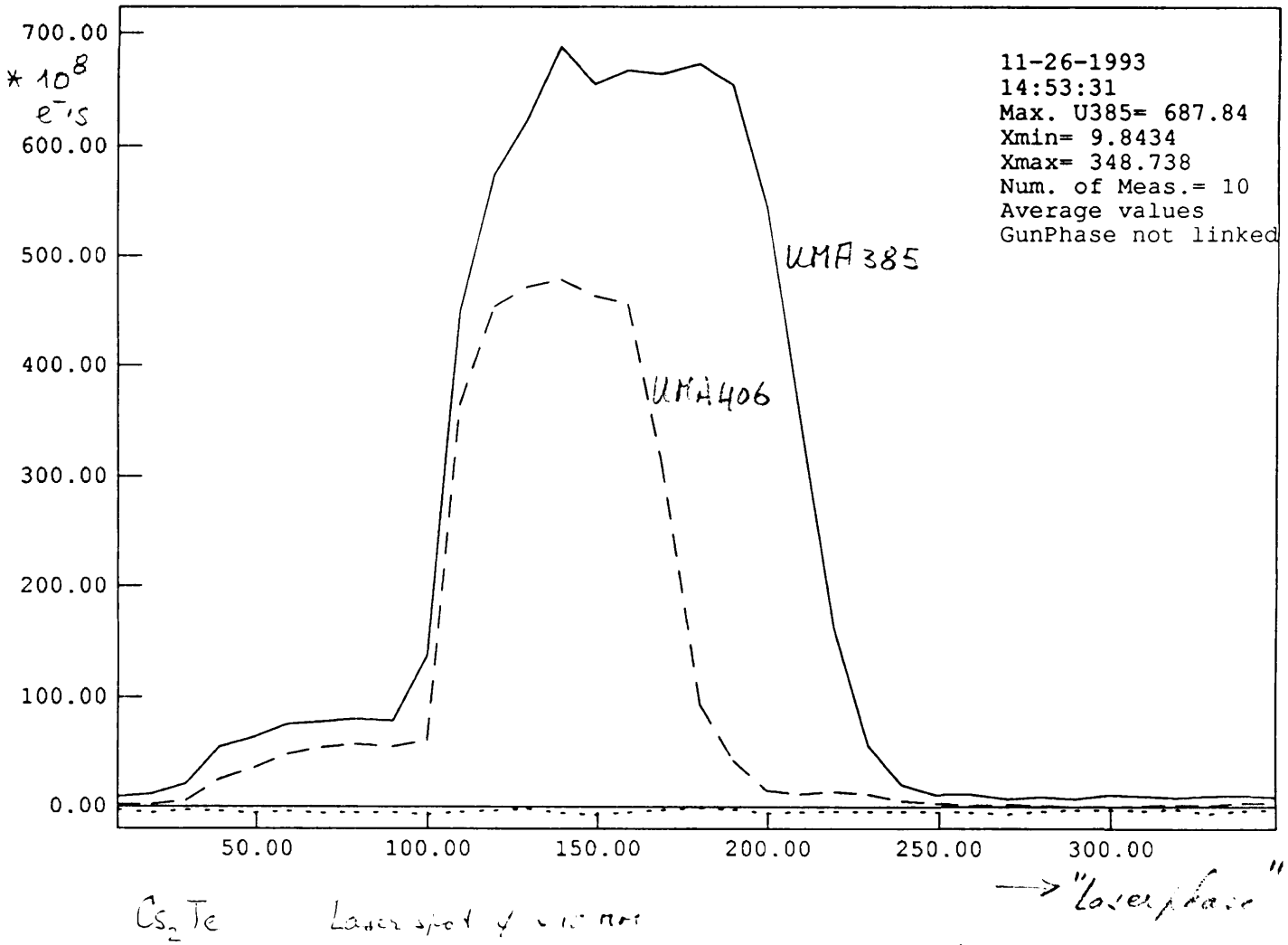
Single bunch

Beam transmission when TRS improved
SNL403 used

	CsI P73		Cs_2Te P192		P196		198
LHI 385	8.7nC	100%	7.5nC	100%	9.4nC	100%	10.4nC	100%
" 405	7.5 "	86 "	6.0 "	80 "	7.6 "	82 "	8.7 "	84 "
" 455	6.1 "	70 "	6.2 "	82 "	7.3 "	78%	7.5 "	72 "
laser on pc	≈ 2μJ		6.5μJ		12.5μJ		20μJ	

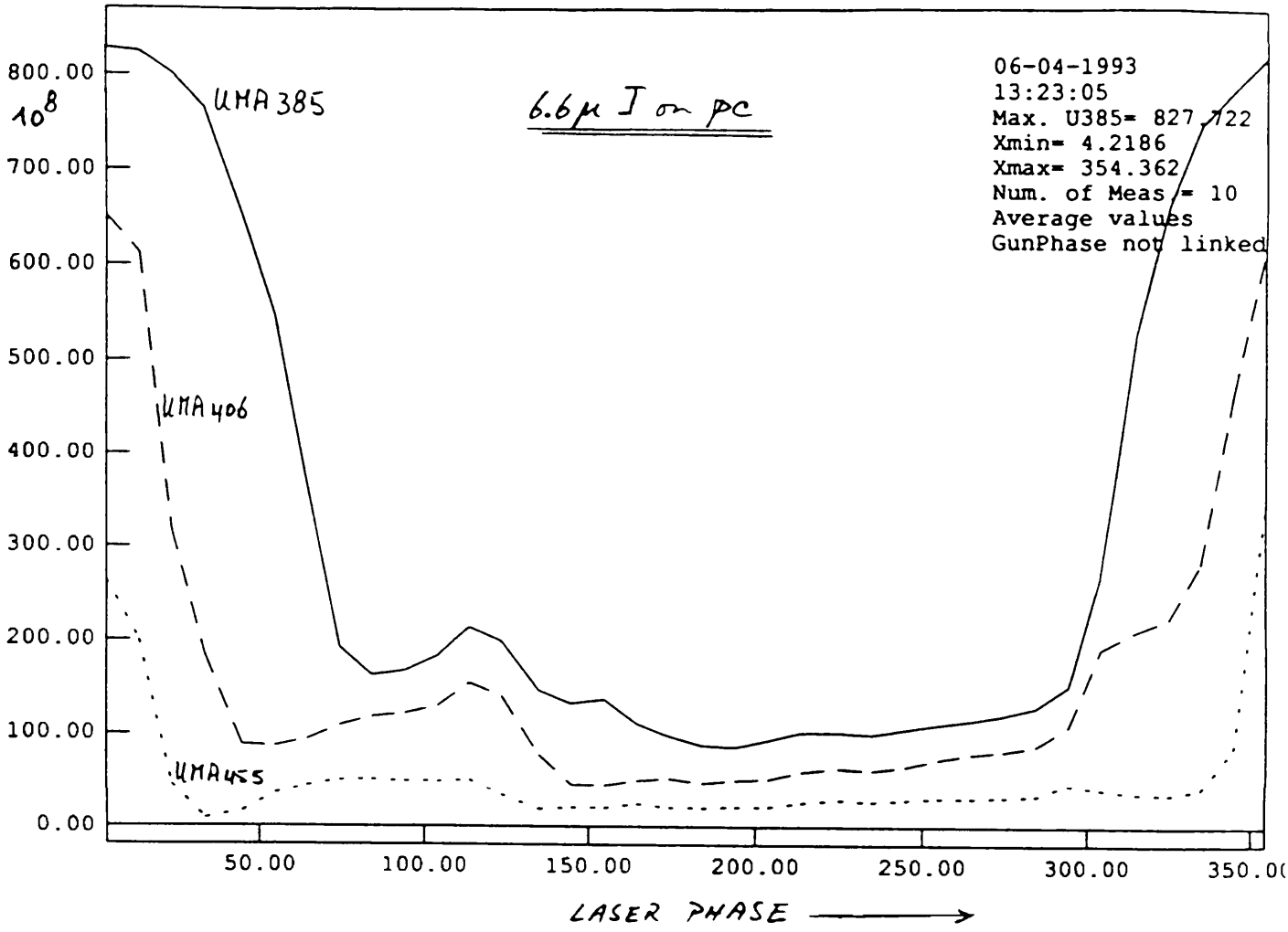
Beam momentum : 53.4 MeV/c from BHZ 500
55.0 " " BHZ 430.

Beam transverse profile : at TCM 445
remaining small at 7.5nC
FWHH x ~ 2 mm
y ~ 1.6 "



Cs_2Te Laser spot ϕ = 1.5 mm

Fig 1


800.00
10^8
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
UMA 385
UMA 406
UMA 455
6.6μ J on PC
06-04-1993
13:23:05
Max. U385= 827.722
Xmin= 4.2186
Xmax= 354.362
Num. of Meas.= 10
Average values
GunPhase not linked
50.00
100.00
150.00
200.00
250.00
300.00
350.00
LASER PHASE

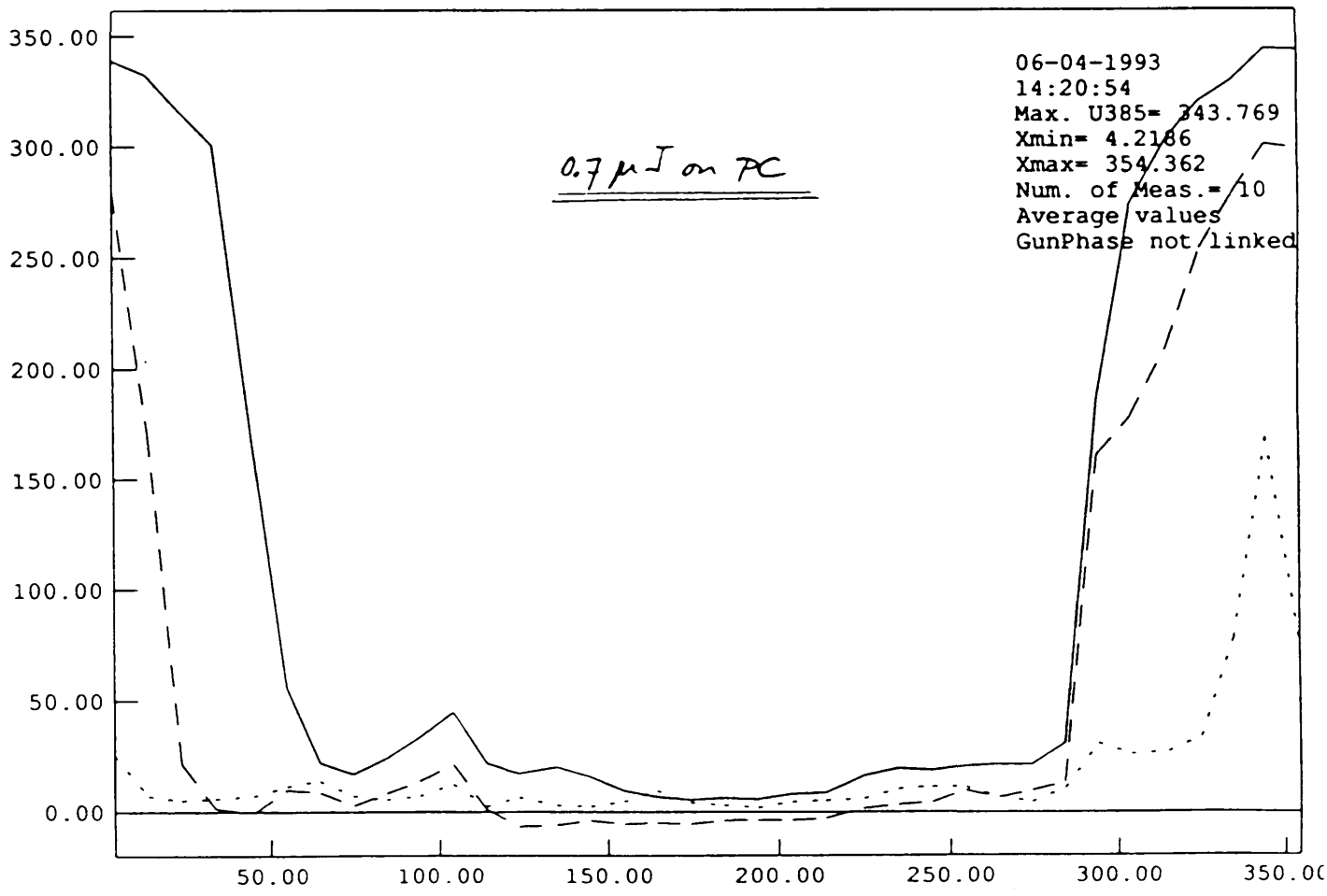
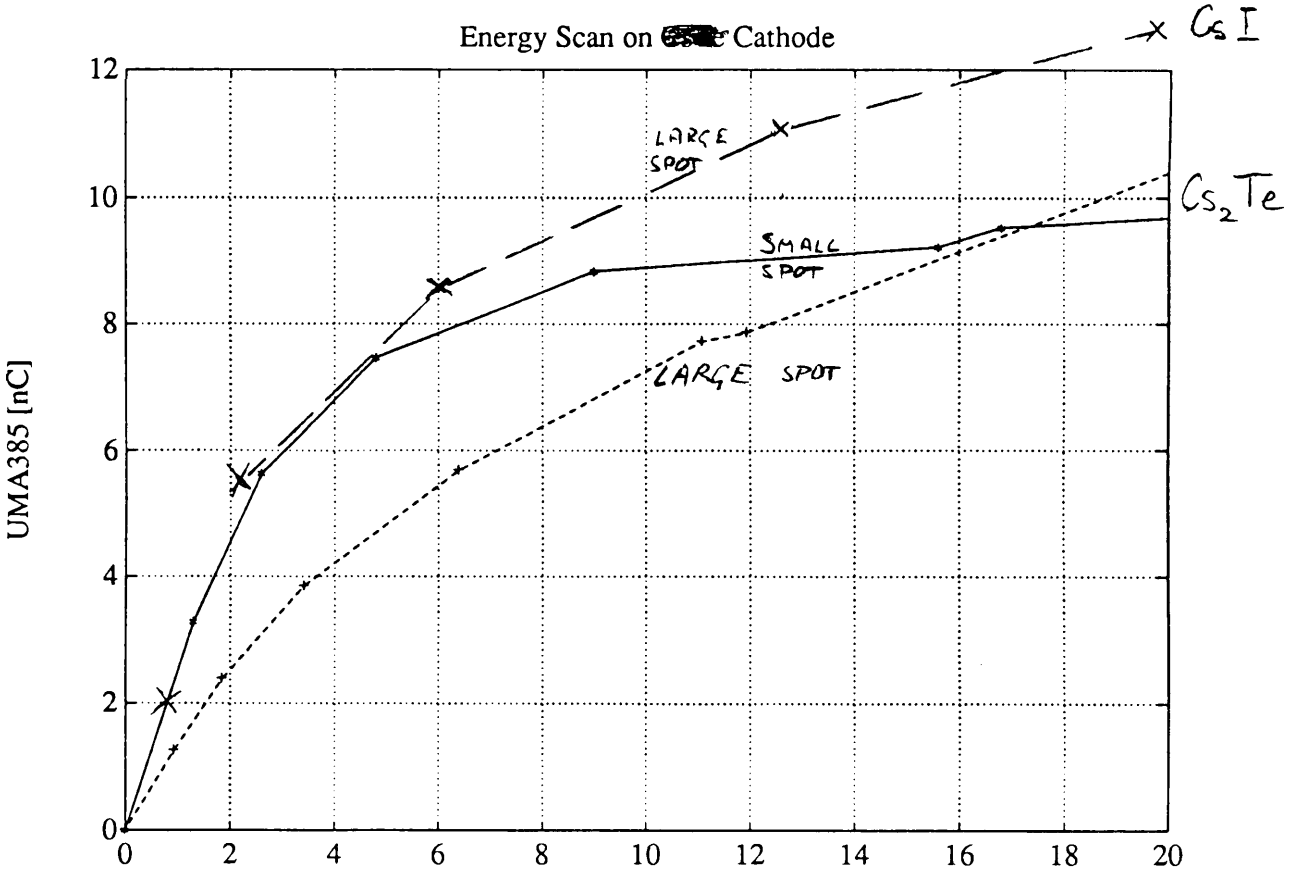

350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
0.7 μ J on PC
06-04-1993
14:20:54
Max. U385= 343.769
Xmin= 4.2186
Xmax= 354.362
Num. of Meas.= 10
Average values
GunPhase not linked
50.00
100.00
150.00
200.00
250.00
300.00
350.00

Fig 2



(·) CHARGE GENERATED IN PC.

Cs_2Te $QE = 1\%$

$Cs\,I$ $QE = 3\%$